Behavioral Outcomes of AIDS Educational Interventions for Drug Users in Short-Term Treatment

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ABSTRACT

This paper reports the behavioral outcomes of informational vs enhanced small-group educational interventions for drug users among 407 subjects in a short-term drug treatment program. Logistic regression was used to analyze drug use and sexual behaviors at the final follow-up visit. Among lower risk subjects, the enhanced intervention was more effective in reducing injection practices that produced risks in terms of human immunodeficiency virus infection; among those at highest risk, the informational interventions were more effective. The enhanced intervention was more effective than the informational interventions in reducing cocaine use at follow-up. No differential intervention effect on sexual risk behaviors was found. (*Am J Public Health.* 1993;83:1463–1466)

Introduction

We have reported previously on the early outcomes of a randomized evaluation of acquired immunodeficiency syndrome (AIDS) educational interventions among 567 drug users admitted to a 21-day inpatient drug detoxification and rehabilitation unit in Massachusetts.[1] In this paper, we describe the longer term behavioral outcomes of the study.

Methods

AIDS educational interventions were carried out by a health educator in small groups.[1] A two-session informational intervention, given during either the first week (early informational) or the second week (late informational) of treatment, provided basic information about human immunodeficiency virus (HIV) transmission, prevention, symptoms, and testing. An enhanced intervention based on social–cognitive and relapse prevention theories was given in six group sessions and one individual counseling session over the first 2 weeks of treatment. The enhanced intervention provided essential information about HIV and AIDS in the same manner as in the informational interventions; however, the enhanced classes focused on putting the knowledge into practice and included a more thorough discussion and practice of situations and skills. All clients were offered HIV-1 antibody testing during their stay.

Table 1 lists the behavioral outcome variables used. The study sample comprised those 407 subjects who completed both the baseline behavioral interview and at least one follow-up interview (85% of the 497 subjects who completed the baseline interview).

Three follow-up interviews were scheduled at approximately 3, 6, and 12 months after admission. We report on the last follow-up visit only; the median time to follow-up was 48 weeks, and 50% of the subjects were followed between 30 and 52 weeks. Interviews were held at five follow-up sites throughout the state to correspond with the distribution of client residences, and incentive payments of $25 were provided. During the later period of follow-up, a tracker was added to locate and interview subjects who had been difficult to follow. Interviews with the tracker were held at additional, more convenient locations, and arrangements were made to interview subjects known to be incarcerated or in drug abuse treatment programs.

We evaluated bivariate associations with the intervention group by cross classification and the chi-square test of homogeneity, and we assessed multivariate associations using multiple logistic regression analysis. For the effects of the interventions on follow-up behavior (measured on an ordinal scale), we used multiple logistic regression analysis with the cumulative logit link function.[2,3] Further details of the analytic methods are available from the authors.

Results

Baseline characteristics of the three intervention groups were similar, except for injection risk (Table 2).

At follow-up, there was a large reduction in the percentage of drug injection (Table 3). This percentage was slightly but not significantly lower in the enhanced group (data not shown). Cocaine use differed significantly at follow-up ($P = .02$): 47% of those in the informational groups vs 33% of those in the enhanced group reported cocaine use (data not shown). Number of sex partners and frequency of condom use did not differ by intervention, either at baseline or at follow-up, and only small changes had occurred in these behaviors.

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TABLE 1—Behavioral Outcome Variables

- All subjects
  - Frequency of injection (n = 401)
  - Cocaine use (n = 388)
  - Summary injection risk (n = 398)
    - Never inject
    - Inject, never borrow
    - Borrow, always clean injection equipment with bleach
    - Borrow, sometimes clean injection equipment with bleach
    - Borrow, never clean injection equipment with bleach
  - Number of sexual partners, opposite and male same sex (n = 401)
- Drug injectors only
  - Number of sharing partners (n = 198)
  - Frequency of lending (n = 195)
  - Frequency of borrowing (n = 191)
- Borrowers only
  - Frequency of cleaning with bleach (n = 101)
- Sexually active subjects only (vaginal or anal sex)
  - Condom use (n = 284)

Note. All behaviors were reported for the "risk period" of up to 3 months[1]; 67% of the subjects had a risk period of 3 months, and 94% had a risk period of 4 or more weeks.

TABLE 2—Selected Characteristics of Study Sample (n = 407), by Assigned Intervention

Variable	Intervention: Early Informational (n = 122), %	Intervention: Late Informational (n = 142), %	Intervention: Enhanced (n = 143), %	*P*
Baseline				
Age, y				
15–24	18.9	16.9	17.5	.50
25–34	58.2	50.0	53.2	
35+	23.0	33.1	29.4	
Sex				
Male	69.7	67.6	66.4	.85
Female	30.3	32.4	33.6	
Race				
Hispanic	10.0	5.0	7.8	.30
Black	11.7	10.0	6.3	
White	78.3	85.0	85.9	
Education, y				
<12	31.4	28.6	20.0	.09
12+	68.6	71.4	80.0	
Baseline injection risk				
No injection	23.7	25.5	16.9	.003
Injects/no borrowing	7.6	24.8	26.1	
Borrows/always bleaches	20.3	13.5	16.9	
Borrows/sometimes bleaches	25.4	24.8	21.8	
Borrows/never bleaches	22.9	11.4	18.3	
Completed intervention				
No	17.2	15.5	24.8	.11
Yes	82.8	84.5	75.2	
Follow-up				
Location				
Free living	74.6	78.2	78.3	.48
Drug treatment	19.7	12.7	14.0	
Jail	5.7	9.2	7.7	
Time to follow-up, mo				
<6	28.7	18.3	18.2	.15
6–12	50.0	60.6	62.9	
>12	21.3	21.1	18.9	
No. of prior follow-up visits				
0	25.4	24.7	21.0	.86
1	27.1	30.3	32.2	
2	47.5	45.1	46.9	

Baseline level of risky injection behavior was the strongest predictor of this behavior at follow-up. Controlling for baseline behavior, there were statistically significant interactions ($P < .05$) between intervention and baseline behavior (Table 4). The enhanced group tended to have greater odds of the same or a safer level of behavior than the informational groups among subjects with safer behavior at baseline. Among subjects who had the riskiest practices at baseline, the enhanced group actually had lower odds of a safe level of behavior. This relationship was more pronounced among those who completed the intervention.

Several other potentially confounding or intervening variables were evaluated by adding them to these multivariable models (data not shown). Older age was independently associated with less safe behavior at follow-up, and its inclusion in the model increased both the magnitude and the statistical significance of the coefficients for the interventions and their interactions with baseline behavior. The addition of number of prior follow-up visits, HIV-1 antibody testing status, awareness of HIV-1 antibody result, subsequent admissions for residential drug-free treatment, detoxification, and high school completion did not affect the intervention coefficients.

The effects of the intervention on rates of drug injection at follow-up are more simply shown in Table 5. The two informational groups are combined in this table because their results were very similar.

We also developed multivariable models for a number of other behaviors that controlled for baseline behavior levels. Behaviors that were restricted to subjects who continued to inject drugs at follow-up (proportion of injections in which injection equipment was borrowed or lent, "bleaching" behavior when equipment was borrowed, and number of sharing partners) consistently indicated greater risk reduction by informational than by enhanced group members, although these differences were not always statistically significant (data not shown).

However, logistic regression models of cocaine use indicated significantly greater odds of cocaine use at follow-up, controlling for baseline use, among both informational groups (odds ratios of 1.77 and 1.79 for the early and late informational groups, respectively, in comparison with the enhanced group; data not shown).

Multivariable models of the sexual behavior variables, number of partners and condom use, revealed no meaningful or statistically significant intervention effects (data not shown). Gender was not associated with sexual behavior at fol-

TABLE 3—Selected Behaviors at Baseline and Follow-Up

	Baseline, %	Follow-Up, %
Drug injection risk		
No injection	22.0	49.8
Injects/no borrowing	20.2	20.1
Borrows/always bleaches	16.7	10.9
Borrows/sometime bleaches	23.9	10.6
Borrows/never bleaches	17.2	8.7
Number of sex partners[a]		
0	16.0	19.5
1	55.3	53.1
2–4	18.9	21.5
5+	9.8	6.0
Condom use (sexually active subjects)		
Always	10.4	18.5
Sometimes	24.7	18.2
Never	64.9	63.3

Note. Behaviors are reported for the risk period (see Table 1). The baseline and follow-up sample sizes, respectively, on which these percentages were based are as follows: drug injection risk, 401 and 404; number of sex partners, 407 and 401; and condom use, 336 and 319.
[a]Heterosexual and male same-sex partners.

TABLE 4—Adjusted Cumulative Odds Ratios for the Same or a Safer Level of Injection Risk at Follow-Up, for Enhanced vs Informational Interventions

	Enhanced vs Early Informational		Enhanced vs Late Informational	
Baseline Level of Risk	Odds Ratio	95% CI	Odds Ratio	95% CI
All subjects (n = 398)				
No injection	2.77	0.78, 9.80	3.05	0.96, 9.71
Injects, no borrowing	1.86	0.72, 4.79	2.14	0.91, 5.02
Borrows, always bleaches	1.25	0.64, 2.43	1.50	0.95, 2.37
Borrows, sometimes bleaches	0.84	0.51, 1.36	1.05	0.66, 1.66
Borrows, never bleaches	0.56	0.33, 0.95	0.73	0.41, 1.33
Intervention completers (n = 319)				
No injection	5.52	1.27, 23.94	4.84	1.24, 18.95
Injects, no borrowing	3.01	1.01, 9.04	2.93	1.07, 8.07
Borrows, always bleaches	1.65	0.76, 3.55	1.78	1.05, 3.01
Borrows, sometimes bleaches	0.90	0.51, 1.57	1.08	0.64, 1.82
Borrows, never bleaches	0.49	0.27, 0.89	0.65	0.32, 1.32

Note. Confidence intervals (CI) were computed from logistic regression analyses with the cumulative logit link function.

TABLE 5—Drug Injection Percentages at Follow-Up, by Intervention, Intervention Completion, and Baseline Injection Risk

	Intervention				
	Information (Combined)		Enhanced		Reduction, %[a]
Baseline Level of Risk	No.	%	No.	%	
All subjects					
No injection	64	16	24	0	100
Injects, no borrowing	43	63	37	49	22
Borrows, always bleaches	42	57	24	54	5
Borrows, sometimes bleaches	64	73	31	65	11
Borrows, never bleaches	43	51	26	73	−43
Intervention completers					
No injection	50	14	17	0	100
Injects, no borrowing	34	62	28	39	37
Borrows, always bleaches	38	63	18	50	21
Borrows, sometimes bleaches	56	73	22	77	−5
Borrows, never bleaches	35	46	21	76	−65

[a]Percentage differential between the informational and enhanced interventions divided by the informational intervention percentage and multiplied by 100%.

low-up when added to these models, and the addition did not change any of the other coefficients.

We investigated the associations of baseline injection risk with prior behavior change and selected psychosocial variables. Subjects at lower risk were more likely to have changed their drug injection behavior and had higher levels of self-efficacy to avoid HIV through safer injection and personal or social skills.

Discussion

Longer term follow-up supports our earlier conclusion that the effects of the two informational interventions, early and late, were generally quite similar. The apparent differential effectiveness of the informational vs enhanced intervention in regard to risky injection behavior among subgroups defined by baseline behavior and the greater effectiveness of the enhanced intervention in regard to cocaine use are new findings.

Subjects at the lower levels of risk at baseline tended to be those who had already made changes in their behavior and had greater self-efficacy to reduce their AIDS risk. Such individuals are perhaps more likely to be in the "action" stage of behavior change[4,5] and to be receptive to an intervention focused on risk-reduction skills.[6] In contrast, those who persist in higher levels of risk behavior in the face of the AIDS epidemic may first need to be motivated to consider making changes. Alternative or additional explanations for these findings not investigated in our study may include a higher prevalence of psychiatric comorbidity among the high-risk subgroup, including personality disorders[7] and cognitive impairment. Study limitations have been described previously.[1]

Just as drug treatment programs may need to be "matched" to client characteristics, AIDS educational interventions may need to take into account relevant client attributes, such as level of risk behavior, stage of behavior change, and psychiatric comorbidity.[8] Future research on AIDS prevention in drug users and in other target groups will need to use more sophisticated, multistage models in which interventions are tailored to the needs of specific subgroups.[9] The mixed, although generally negative, effects of educational interventions for drug users reported to date[10–16] suggest that education alone is unlikely to be sufficient to achieve lasting behavior change. □

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The Taking of Free Condoms in a Drug Abuse Treatment Clinic: The Effects of Location and Posters

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ABSTRACT

Drug abuse treatment programs can help reduce high-risk sexual behavior in drug users by promoting condom use. This study examined the influence of distribution location and poster prompts on the taking of free condoms in a drug abuse treatment clinic. Over 6 months, condoms were available alternately, with and without poster prompts, in the clinic's private restroom or public waiting area. Overall, 381% more condoms were taken from the restroom. The presence of poster prompts did not affect condom taking. These results suggest that distribution location is a critical factor in promoting condom taking in a public clinic. (*Am J Public Health.* 1993;83:1466–1468)

Introduction

Needle sharing among intravenous drug users and unprotected sexual contact are behavioral risk factors contributing to the spread of human immunodeficiency virus (HIV) infection and the acquired immunodeficiency syndrome (AIDS). National trends suggest that the second highest increase in AIDS cases is among heterosexual intravenous drug users.[1] Alarmingly, sexual contact between heterosexual intravenous drug users and their partners accounts for 24.6% of the nation's reported AIDS cases, a 9.8% increase since 1990.[1]

Condom use is the most powerful factor in preventing HIV transmission during sexual encounters.[2] Unfortunately, AIDS education and HIV antibody testing have not significantly increased condom use or reduced high-risk sexual behavior in drug users.[3–5] The majority of intravenous drug users still report minimal or no condom use.[4–11] Even within the general heterosexual population, only 12.6% of individuals with risky sexual partners (e.g., partners who are HIV positive or use intravenous drugs) report always using condoms.[12]

Treatment reduces intravenous drug use and needle sharing,[13] and provision and promotion of condoms may help reduce risky sexual behavior among intravenous drug users and their partners.[14] Importantly, condom taking may be influenced by distribution location and prompt-

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